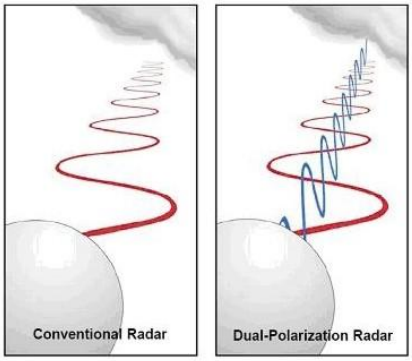
Dual Polarization Radar upgrade at NWS Gaylord Michigan

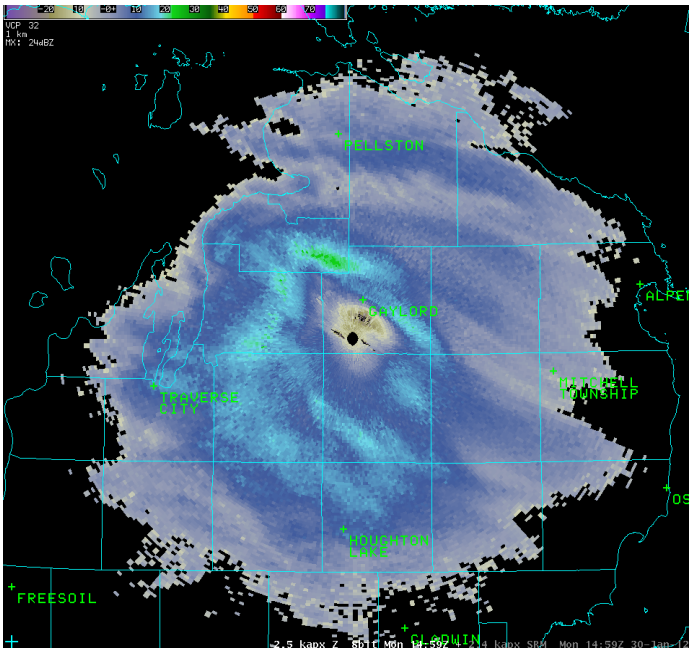
Winter Weather Applications

The dual polarization radar upgrade at NWS Gaylord Michigan which occurred back in October 2011 provided a new level of radar data to meteorologists at the office. Basically, as the image below indicates, dual polarization radar samples both the horizontal and vertical aspects of precipitation particles in the cloud (e.g. snow, rain, hail, etc.) versus conventional radar, which only samples the horizontal aspect. This added data provides meteorologists information about precipitation shape and therefore type.



On the morning of Monday, January 30th, 2012 a band of light snow spread into northern Michigan ahead of an approaching warm front. Using legacy radar products such as reflectivity (i.e. amount of power reflected back to the radar from precipitation), the arriving snow had the following appearance:

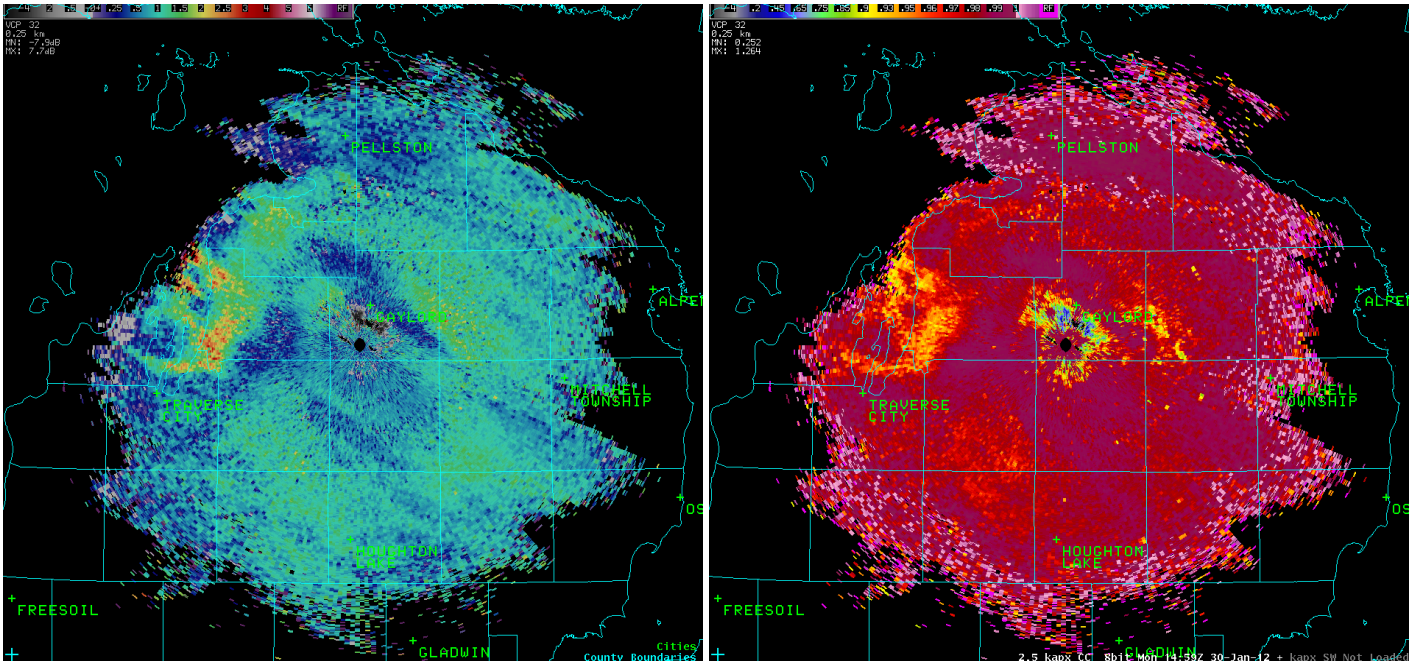
Reflectivity



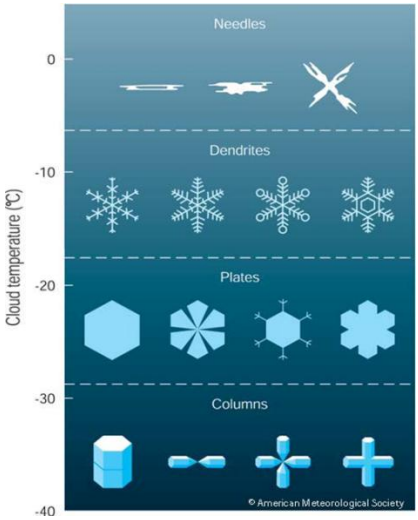
The image above shows a wide swath of generally light snow moving into the region.

The two images below show new products that are now available with the dual polarization radar upgrade. The image on the left shows a variable called **Differential Reflectivity**, and tells forecasters the *shape* of the precipitation particles in the cloud. The second, on the right, is **Correlation Coefficient**, which shows the *diversity* of precipitation particles in the cloud. In other words, is there mostly one variety of precipitation particle in the cloud (i.e. one type of snowflake) or many (i.e. mixed rain and snow, mixed types of ice crystals)?

Differential Reflectivity ***Correlation Coefficient***



What do these images tell us? While the cold temperatures outside ensured that this precipitation would take the form of snow, the values of differential reflectivity and correlation coefficient, combined with forecaster's knowledge of temperatures throughout the atmosphere indicate that the snowflakes in the cloud were of the dendrite variety, versus other snow crystal types such as needles or columns.



Why is this information important? It gives forecasters information about how "fluffy" the falling snow will be, which plays a large role in determining snow accumulations.

Bottom Line: Dual Polarization radar provides the opportunity for improved determination of expected snowfall amounts when snow is falling near the radar.

Want more information about Dual Polarization Radar? See the online training provided by the National Weather Service Warning Decision Training Branch at:

http://www.wdtb.noaa.gov/courses/dualpol/outreach/non-mets-intro/player.html